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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,486	07/31/2000	GREGORY J. DUNN	CM01297I	4665

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MOTOROLA, INC.
1303 EAST ALGONQUIN ROAD
IL01/3RD
SCHAUMBURG, IL 60196

EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 07/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/628,486

Applicant(s)

DUNN, GREGORY J.

Examiner

Jeremy Norris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-15 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because the phrase "is provided" in line one. Correction is required. See MPEP § 608.01(b). Examiner suggests simple deletion of this phrase.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by US 5,920,454, granted to Nomura et al. (hereafter Nomura).

Nomura discloses, referring to figure 4, a method of forming a capacitor on a printed circuit board, the method comprising the steps of: providing a first metal plate (2a) on a dielectric substrate (1), said first metal plate having a first region and a second region, applying a dielectric layer (4a) onto the first region of the conductive metal plate, whereby the second region of the first metal plate is exposed, depositing a second metal plate onto the dielectric layer (5a) and the second region (9) of the first metal plate such that the dielectric layer is enclosed within the first metal plate and the second metal plate, and patterning said second metal plate to form an electrode overlying the dielectric layer and electrically isolated from the first metal plate, said electrode being spaced apart from the first metal plate by the dielectric to form a capacitor (see col. 6, 50-65) [claim 1].

Claims 10-15 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,115,233, granted to Seliskar et al (hereafter Seliskar).

Seliskar discloses, referring to figure 6, a printed circuit board having an integrally formed capacitor (110), said printed circuit board comprising a dielectric substrate, an lower electrode structure comprising a metal plate (18) overlying the dielectric substrate and having a first region and a second region about the first region, a dielectric layer (20) overlying the first region of the first metal plate and having a perimeter surface, an upper electrode (24) overlying the dielectric layer, wherein said lower electrode

structure further comprises an extension (180) disposed on the second region of said metal plate and about the dielectric layer, said extension comprising a lip overlying the perimeter surface thereof, said upper electrode being spaced apart from the lip by a trench [claim 10], further comprising a polymeric layer (26) overlying the capacitor and having a via (30) communicating with the electrode, and a metal (see col. 4, lines 60-65) connection extending through the via to the electrode [claim 11], wherein the upper electrode and the lower electrode are formed of copper [claim 12], wherein the dielectric layer is composed of a photopolymeric material [claim 13], wherein the photopolymeric material is an epoxy based resin [claim 14], wherein the dielectric layer has a thickness between 5 and 50 microns (see col. 3, lines 45-60) [claim 15].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura in view of US 6,025,057 granted to Angelopoulos et al. (hereafter Angelopoulos).

Nomura discloses the claimed invention as described above with respect to claim 1 except Nomura does not specifically state that the dielectric layer is composed of a photopolymer material. However, Nomura does teach that the dielectric layer may comprise epoxy resin (see col. 5, lines 20-25). Additionally, it is well known in the art

that epoxy resins may be photoimaged as evidenced by Angelopoulos (see col. 4, lines 10-15). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use a photoimagable epoxy resin for the dielectric layer in the invention of Nomura. The motivation for doing so would have been to take advantage of the dielectric properties of the easily obtainable epoxy resin. Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura in view of US 6,021,563, granted to Heo et al. (hereafter Heo).

Nomura discloses the claimed invention as described above except Nomura does not specifically state that the second metal plate is deposited by a plating process. However, it is well known in the art that a conductive layer of silver can be plated as well as printed as evidenced by Heo (see col.2, lines 20-25). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to form the silver layer in the invention of Nomura by a plating process since plating and printing are art recognized equivalents.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura in view of US 6,115,233, granted to Seliskar et al. (hereafter Seliskar).

Nomura discloses the claimed invention as described above with respect to claim 1, including further comprising coating the capacitor with a polymeric layer (12, see col. 7, lines 10-15) except Nomura does not specifically disclose forming a via in said

polymeric layer communicating with the electrode, and depositing metal within the via to form an electrical connection to the electrode. However, Seliskar teaches covering a embedded capacitor (12) with an insulator layer (26) and forming a via (30) in the layer and depositing metal (see col. 4, lines 60-65) in the via to form an electrical connection. Therefore, it would have been obvious to add a via to the invention of Nomura as taught by Seliskar. The motivation for doing so would have been to allow for communication from the capacitor to the other signal layers of the device.

Claims 5-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura, in view of Angelopoulos, Heo, and Seliskar.

Nomura discloses the basics of the claimed invention as described above with respect to claim 1. Nomura does not specifically state that the dielectric layer is composed of a photopolymer material. However, Nomura does teach that the dielectric layer may comprise epoxy resin (see col. 5, lines 20-25). Additionally, it is well known in the art that epoxy resins may be photoimaged as evidenced by Angelopoulos (see col. 4, lines 10-15). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use a photoimagable epoxy resin for the dielectric layer in the invention of Nomura. The motivation for doing so would have been to take advantage of the dielectric properties of the easily obtainable epoxy resin. Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Additionally, the invention of Nomura as modified by Angelopoulos does not specifically state that the second metal plate is deposited by a plating process.

However, it is well known in the art that a conductive layer of silver can be plated as well as printed as evidenced by Heo (see col.2, lines 20-25). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to form the silver layer in the invention of Nomura as modified by Angelopoulos by a plating process since plating and printing are art recognized equivalents.

Moreover, the invention of Nomura as modified by Angelopoulos and Heo does not specifically disclose forming a via in said polymeric layer communicating with the electrode, and depositing metal within the via to form an electrical connection to the electrode. However, Seliskar teaches covering a embedded capacitor (12) with an insulator layer (26) and forming a via (30) in the layer and depositing metal (see col. 4, lines 60-65) in the via to form an electrical connection. Therefore, it would have been obvious to add a via to the invention of Nomura as modified by Angelopoulos and Heo taught by Seliskar. The motivation for doing so would have been to allow for communication from the capacitor to the other signal layers of the device.

Regarding claim 6, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to form the dielectric layer between about 5 and 50 microns thick based on the desired capacitance. Furthermore Seliskar teaches that this is an appropriate range for a dielectric layer for an embedded capacitor (see Seliskar, col. 3, lines 45-60).

Moreover, it is clear that the modified invention of Nomura discloses that the photopolymeric material is an epoxy based resin [claim 7], and that wherein the first metal plate and the second metal plate are formed of copper [claim 9].

Allowable Subject Matter

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 8 states the limitation "said first portion being irradiated by actinic radiation effective to initiate polymerization of the photosensitive polymer, said portion being sized and shaped corresponding to the dielectric layer, heating the photopolymeric layer to partially cure the first portion". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy Norris whose telephone number is 703-306-5737. The examiner can normally be reached on Mon.-Th., 9AM - 6:30 PM and alt. Fri. 9AM-5:30PM.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7724 for regular communications and 703-305-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JCSN
June 27, 2002



DAVID L. TALBOTT
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800